Chapter 8
Install the Routing Node

Before installing the routing node, you should have prepared your site and reviewed the guidelines in “Prepare the Site” on page 49, and unpacked the routing node from the shipping crate as described in “Prepare to Install the Routing Node” on page 99.

This chapter discusses the following routing node installation topics:

Tools and Parts Required

To install the routing node, you need the following tools and parts:

Mechanical lift

Phillips (+) screwdrivers, numbers 1 and 2

Flat-blade (–) screwdriver, number 1

7/16-in. socket wrench

3/8-in. nut driver

26 Cage nuts (for installation in a four-post rack or a cabinet)

Wire cutters

Pliers

ESD grounding wrist strap

Install the Mounting Hardware

The routing node can be installed into a center-mount, front-mount, or four-post rack or a cabinet. Before you install the routing node, you install the mounting hardware onto the rack. The procedures for installing the mounting hardware differ for the different types of racks. This section describes the prodecures for installing the mounting hardware:

Install the Mounting Hardware for a Four-Post Rack or Cabinet on page 106

Install the Mounting Hardware for a Center-Mount or Front-Mount Rack on page 108

Install the Mounting Hardware for a Four-Post Rack or Cabinet

If you are installing the routing node into a four-post rack or cabinet, you must first install the front and rear mounting shelves and the spacer bars onto the rack.

To install the mounting shelves and spacer bars, follow this procedure (see Figure 30):

1. Determine the position on the rack to install your routing node. The bottom of the front shelf should line up with one of the standard “U” divisions on the rack.

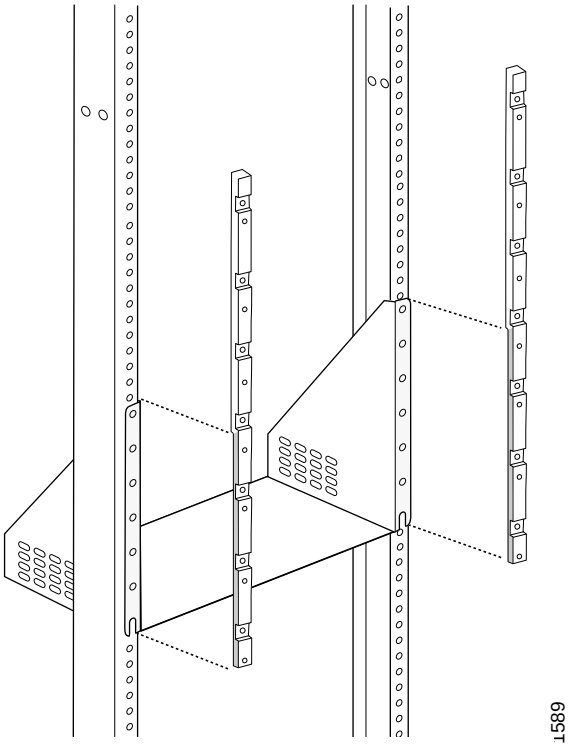
2. Install cage nuts in the holes 2, 6, 15, 24, 33, 42, 51, and 60 spaces up from the bottom of the shelf.

3. On the front of each rack rail, partially insert a mounting screw into the hole containing the bottom cage nut.

4. Install the front shelf onto the front of the rack rails with the bottom slot on each ear resting on one of the installed mounting screws.

5. Place one of the spacer bars over an ear of the installed shelf, with the notch in the rear of the spacer bar positioned so the upper part of the bar is flush with the rack rail and the lower part is flush with the ear of the shelf (see Figure 29).

Figure 29: Position the Spacer Bar on the Rack



6. Insert a mounting screw into each of the nonthreaded holes in the recesses of the spacer bar to secure the spacer bar. Each hole should have a cage nut behind it.

7. Repeat Steps 5 and 6 for the other spacer bar.

8. Tighten all the screws completely.

9. Determine the position on the rack to install the rear shelf. The bottom of the rear shelf should align with the same “U” division as the front shelf. The shelf installs onto the back of the rear rails, either extending forward towards the center of the rack or out from the rear of the rack, depending on rack depth.

10. Install cage nuts in the holes 3, 6, 9, 12, and 15 spaces up from the bottom of the shelf.

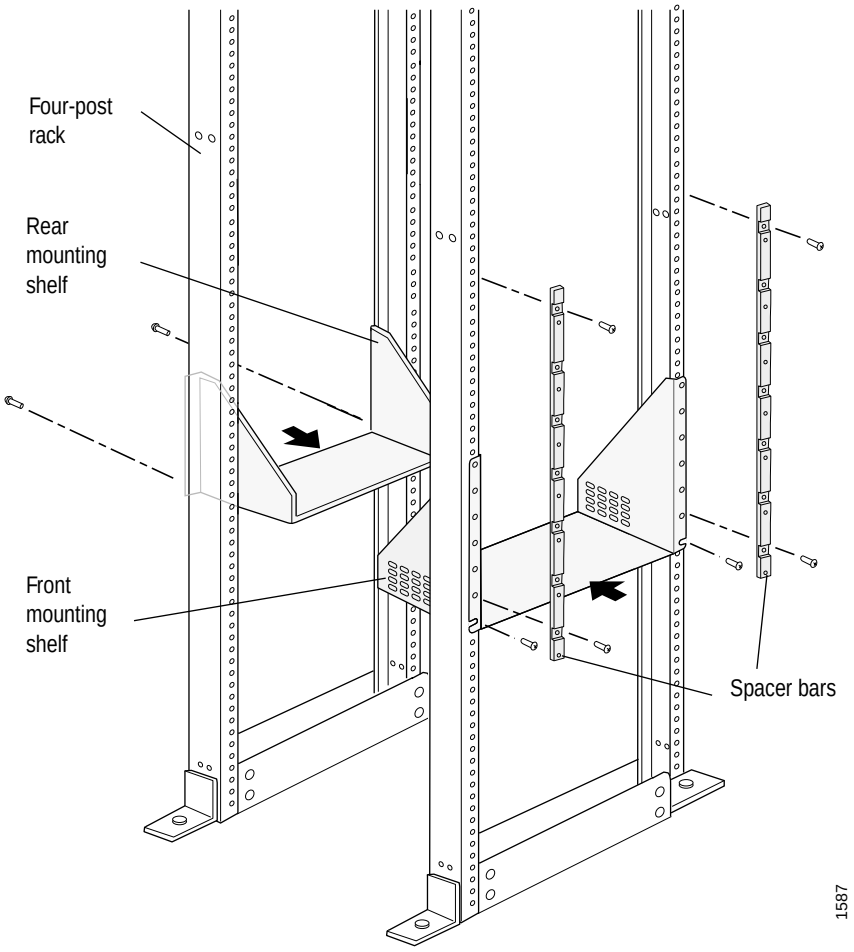
11. Partially insert a mounting screw into the hole with the top cage nut (15 spaces up from the bottom) on each rack rail.

12. Install the rear shelf onto the rack with the second slot from the top of each ear resting on one of the installed mounting screws. Flex the sides of the shelf inward as you install it so the ears fit between the screws.

13. Insert screws into the open holes in the ears of the shelf, tightening each partway. Each hole should have a cage nut behind it.

14. Tighten all the screws completely.

Figure 30: Install the Mounting Hardware for a Four-Post Rack or Cabinet



Install the Mounting Hardware for a Center-Mount or Front-Mount Rack

If you are installing the routing node into a center-mount or front-mount rack, you must first install the front mounting shelf onto the rear of the rack rails.

To install the front mounting shelf, follow this procedure (see Figure 31):

1. Determine the position on the rack to install your routing node. The bottom of the front shelf should line up with one of the standard "U" divisions on the rack.

2. Count up to the 30th hole above the “U” division on the rear of the rack rail.

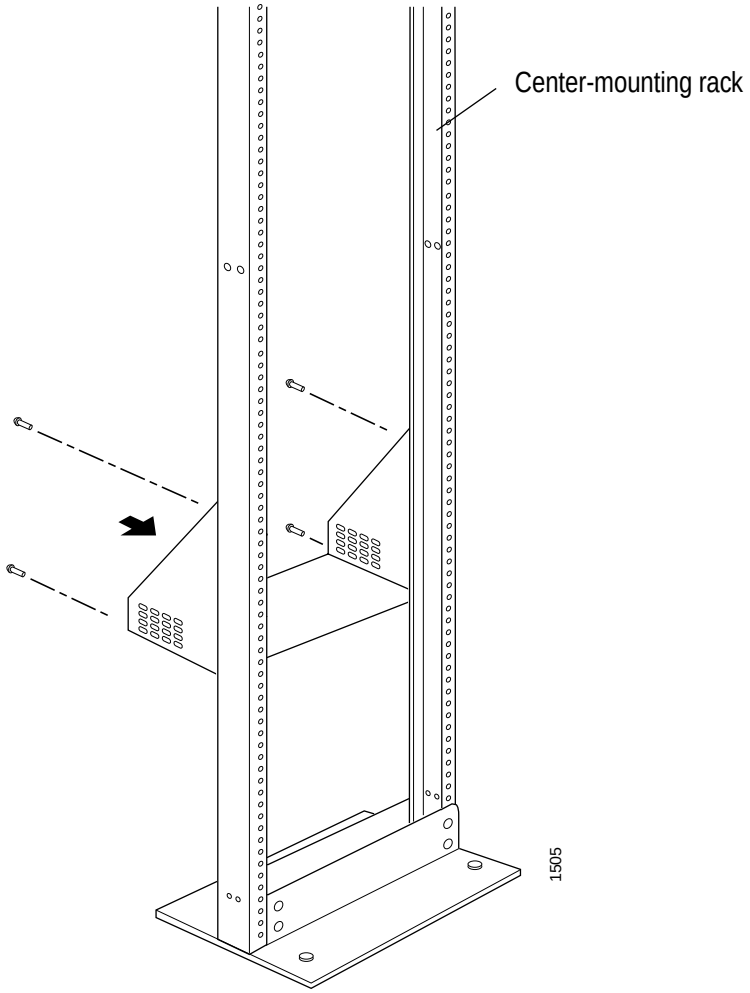
3. Partially insert a mounting screw into the hole described in Step 2 on rear of each rack rail.

4. Install the front shelf onto the rack with the keyhole slot on the top of each ear resting on one of the installed screws.

5. Partially insert screws into the open holes in the ears of the shelf.

6. Tighten all the screws completely.

Figure 31: Install the Mounting Hardware for a Center-Mount or Front-Mount Rack



When the mounting hardware is installed, proceed to “Install the Routing Node Using a Lift” on page 110, or to “Install the Routing Node Manually” on page 113, depending on your type of installation.

Install the Routing Node Using a Lift

Because of the routing node's size and weight—up to 565 lb (256.3 kg) depending on configuration—we strongly recommend that you install the routing node using a lift. Installing the routing node into the upper position in a rack or cabinet requires a lift.

Before installing the routing node into the rack, read the safety information in "Chassis Lifting Guidelines and Warnings" on page 68. Remove the routing node from the shipping crate as described in "Unpack the Routing Node" on page 101. Install the mounting hardware as described in "Install the Mounting Hardware" on page 106.

If you are installing two routing nodes into one rack, install the lower one first.

Before installing the router in a front-mount rack, have a qualified technician verify that the rack is strong enough to support the router's weight and is adequately supported at the installation site.

To install the routing node using a lift, follow this procedure (see Figure 33):

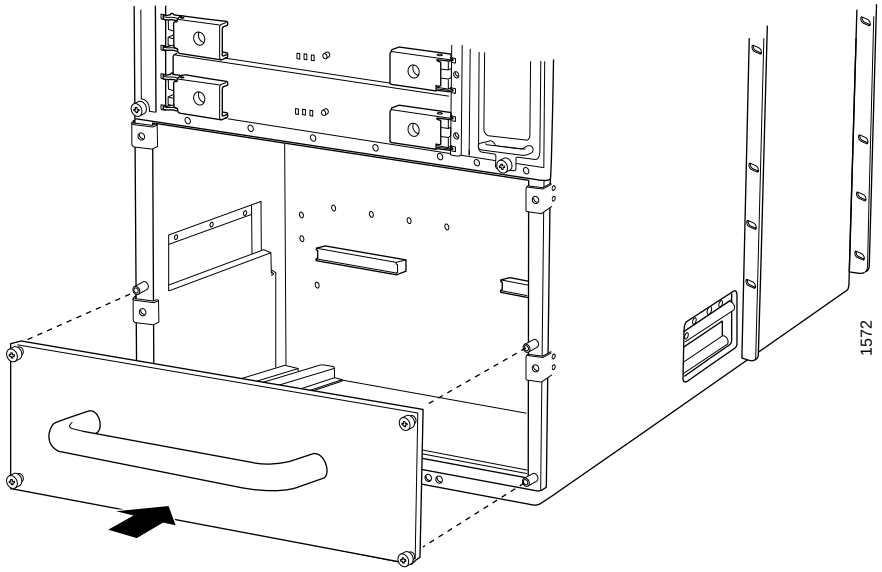
1. Ensure that the rack is in its permanent location and is secured to the building. Ensure that the installation site allows adequate clearance for both air flow and maintenance. For details, see "Prepare the Site" on page 49.

2. Remove the power supplies as described in "Remove the Power Supplies" on page 114.

3. Insert the captive screws on the installation handle into the holes occupied by the lower set of captive screws for the two power supplies.

4. Attach the installation handle, tightening the captive screws firmly to secure it to the chassis (see Figure 32).

Figure 32: Attach the Installation Handle



5. Load the routing node onto the lift, making sure it rests securely on the lift platform.

6. Using the lift, position the routing node a few inches above the front mounting shelf installed in the rack.

7. Carefully lower the routing node onto the shelf. The shelf ensures that the holes in the mounting ears align with the holes in the rack rails.

8. Push the routing node back onto the shelf until the mounting ears contact the rack rails. Use the installation handle and the handles on the sides of the chassis to help position the routing node.

> **Caution**
>
> Do not use the installation handle or the handles on the chassis to lift the full weight of the routing node. Use these handles only to help position the routing node, and to assist in lifting.

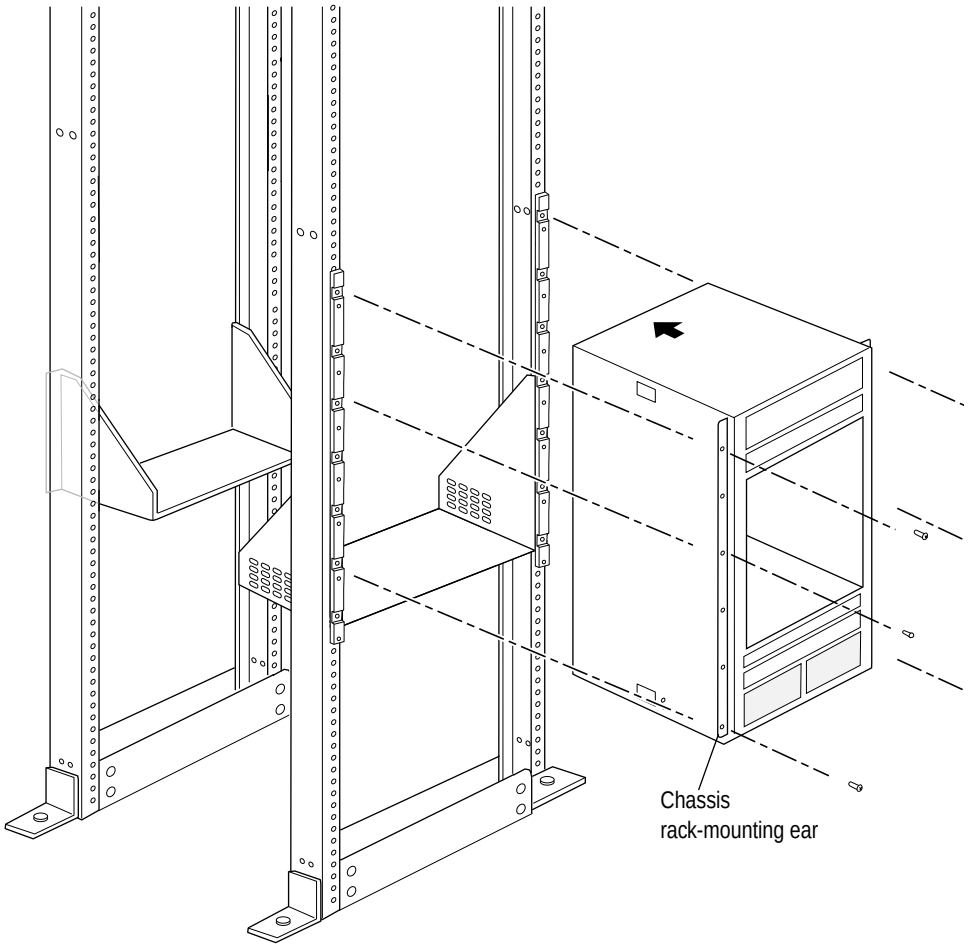
9. Move the lift away from the rack.

10. If you are installing the routing node in a four-post rack or cabinet, install a mounting screw into each of the holes aligned with the threaded holes in the spacer bars. If you are installing the router into a center-mount or front-mount rack, install a mounting screw into each of the open mounting holes, starting from the bottom.

11. Loosen the captive screws at the corners of the installation handle to remove the handle from the routing node.

12. Reinstall the power supplies as described in “Reinstall the Power Supplies” on page 129.

Figure 33: Install the Routing Node into the Rack



Note

This illustration depicts the router being installed into a four-post rack. If you are installing the router into a center-mount or front-mount rack, only the front shelf is attached to the rack (see Figure 32 for an illustration of center-mounting hardware).

Verify That the Routing Node Is Installed Correctly

Visually inspect the alignment of the routing node. If the routing node is installed properly in the rack, all the mounting screws on one side of the rack should be aligned with the mounting screws on the opposite side and the routing node should be level.

Install the Routing Node Manually

If you cannot use a mechanical lift to install the routing node, you can install it manually. Before installing the routing node manually, you must first remove components from the chassis and reinstall the components once the routing node is installed in the rack. At least four people are needed to safely lift the chassis into the rack, and a fifth person is needed to secure the mounting screws. With components removed, the chassis weighs approximately 210 lb (95.3 kg).

Before installing the routing node into the rack, read the safety information in “Chassis Lifting Guidelines and Warnings” on page 68. Remove the routing node from the shipping crate as described in “Unpack the Routing Node” on page 101. Install the mounting hardware as described in “Install the Mounting Hardware” on page 106.

If you are installing two routing nodes into one rack, install the lower one first.

Before installing the router in a front-mount rack, have a qualified technician verify that the rack is strong enough to support the router’s weight and is adequately supported at the installation site.

To install the routing node manually, use the following procedures:

Remove Components from the Chassis on page 114

Install the Chassis into the Rack Manually on page 123

Verify That the Routing Node Is Installed Correctly on page 126

Reinstall Components into the Chassis on page 126

Remove Components from the Chassis

To make the routing node light enough to install manually, you first remove most components from the chassis. The procedures in this section for removing components from the chassis are for initial installation only, and assume that you have not connected power cables to the routing node. The following procedures describe how to remove components from the chassis:

From the rear of the chassis:

Remove the Power Supplies on page 114

Remove the SIBs on page 115

Remove the CBs on page 116

Remove the SCGs

Remove the Rear Fan Tray on page 118

From the front of the chassis:

Remove the Cable Management System on page 120

Remove the Front Fan Trays on page 120

Remove the FPCs on page 121

Remove the Power Supplies

The power supplies are located at the rear of the chassis below the SIBs. Each power supply weighs approximately 23.1 lb (10.5 kg).

To remove the power supplies, follow this procedure:

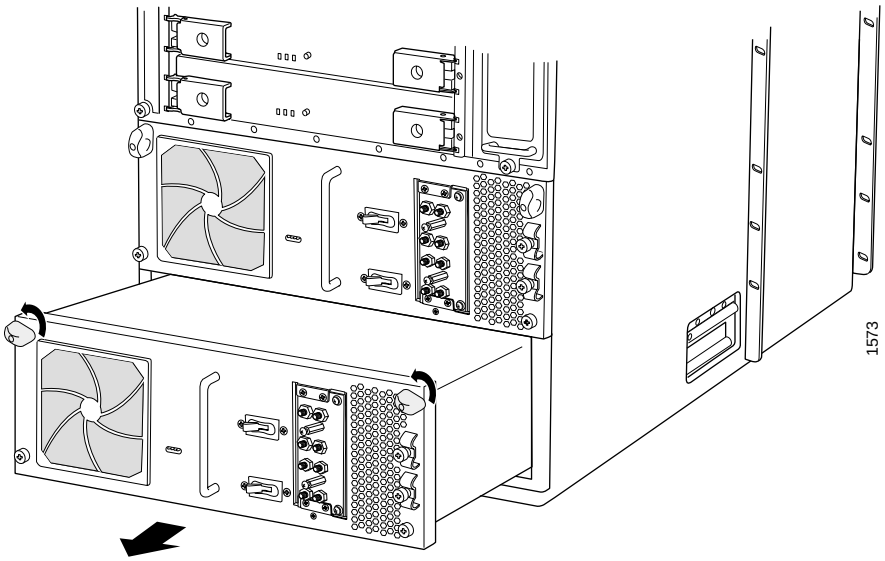
1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
2. Turn both circuit breakers on the power supply faceplate OFF.
3. Loosen the captive screws on the lower corners of the upper power supply faceplate, then twist the ejector handles on the upper corners of the faceplate counterclockwise to unseat the power supply.
4. Grasp the handle on the power supply faceplate, pull firmly to start the power supply out of the chassis, and slide it halfway out of the chassis (see Figure 34).

5. Place one hand underneath the power supply to support it and slide it completely out of the chassis.

> **Caution**
>
> Each power supply weighs over 23 lb (10.5 kg). Be prepared to support the full weight of the power supply as you remove it from the routing node.

6. Repeat Steps 2 through 5 to remove the lower power supply.

Figure 34: Remove a Power Supply



Remove the SIBs

The routing node has five SIBs installed. The SIBs are located in the rear of the chassis in the slots marked SIB0 through SIB4. Each SIB weighs approximately 6.8 lb (3 kg).

To remove the SIBs, follow this procedure (see Figure 35):

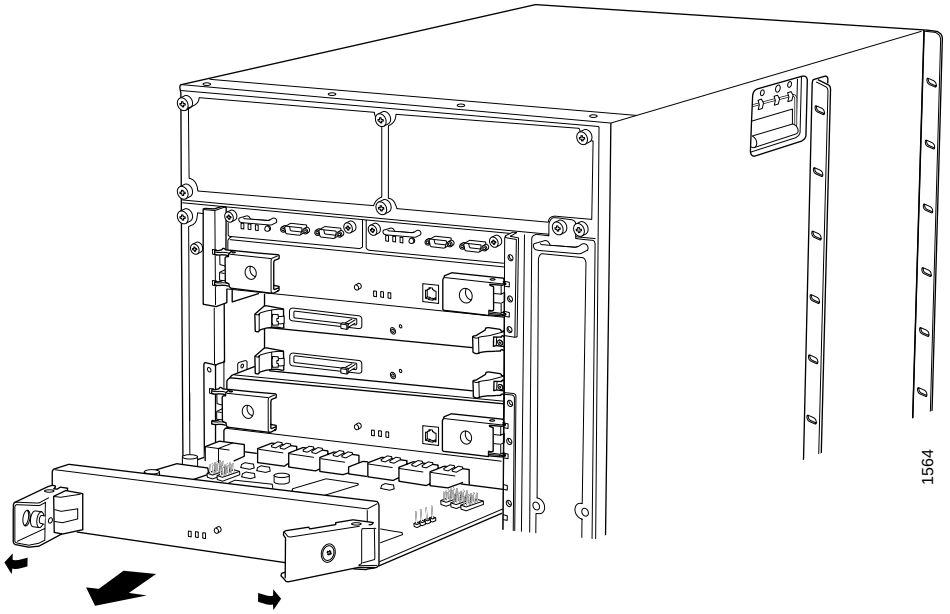
1. Have ready an antistatic mat placed on a stable, flat surface.
2. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
3. Loosen the captive screws on the ejector handles on each side of the SIB faceplate.
4. Flip the ejector handles outward to unseat the SIB.

5. Grasp both ejector handles, pull firmly on the SIB, and slide the SIB about three-quarters of the way out of the chassis.

6. Move one of your hands underneath the SIB to support it, and slide it completely out of the chassis.

7. Repeat Steps 3 through 6 for each of the remaining SIBs.

Figure 35: Remove a SIB



Remove the CBs

The routing node can have one or two CBs. They are located in the upper rear of the chassis in the slots marked CB0 and CB1. Each CB weighs approximately 5 lb (2.3 kg).

To remove the CBs, follow this procedure (see Figure 36):

1. Have ready an antistatic mat, placed on a flat, stable surface.

2. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.

3. Loosen the captive screws on the ejector handles on both sides of the CB faceplate.

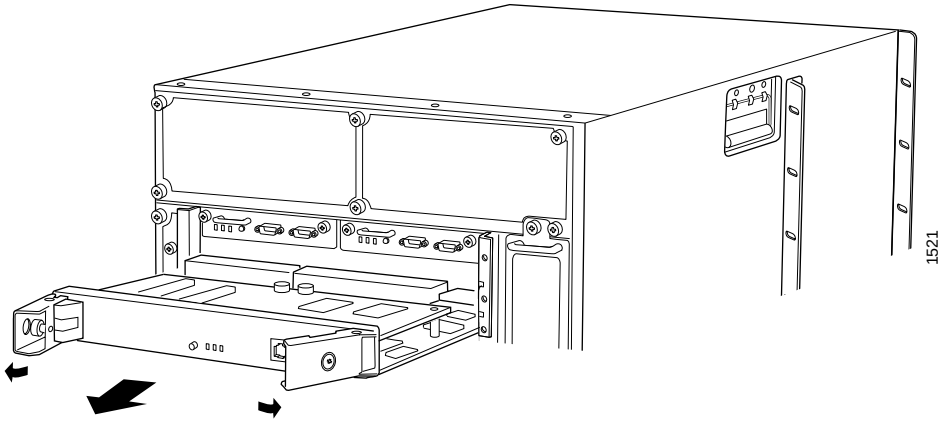
4. Flip the ejector handles outwards to unseat the CB.

5. Grasp the ejector handles and slide the CB about halfway out of the chassis.

6. Move one of your hands underneath the CB to support it, and slide it completely out of the chassis.

7. Repeat Steps 3 through 6 for the second CB.

Figure 36: Remove a CB



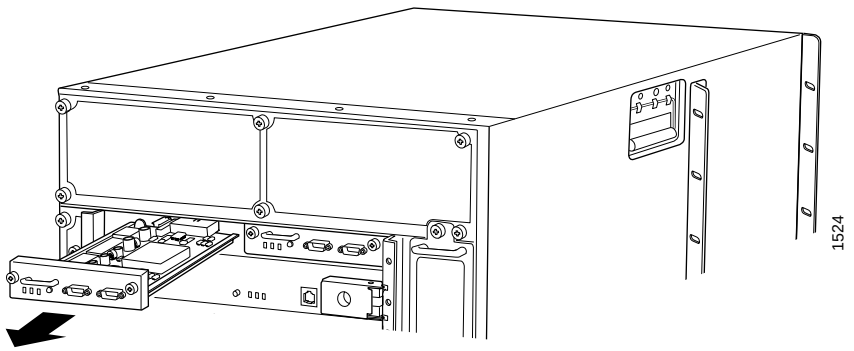
Remove the SCGs

The routing node can have one or two SCGs installed. The SCGs are located in the upper rear of the chassis, above the CBs and Routing Engines. Each SCG weighs approximately 1.9 lb (0.9 kg).

To remove the SCGs, follow this procedure:

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
2. Press the online/offline button on the SCG faceplate and hold it down until the LED goes out (about 5 seconds).
3. Loosen the captive screws on the edges of the SCG faceplate.
4. Grasp the SCG by the handle on the faceplate and slide it out of the chassis.
5. Place the SCG on the antistatic mat.
6. Repeat Steps 2 through 5 for the second SCG.

Figure 37: Remove an SCG



Remove the Rear Fan Tray

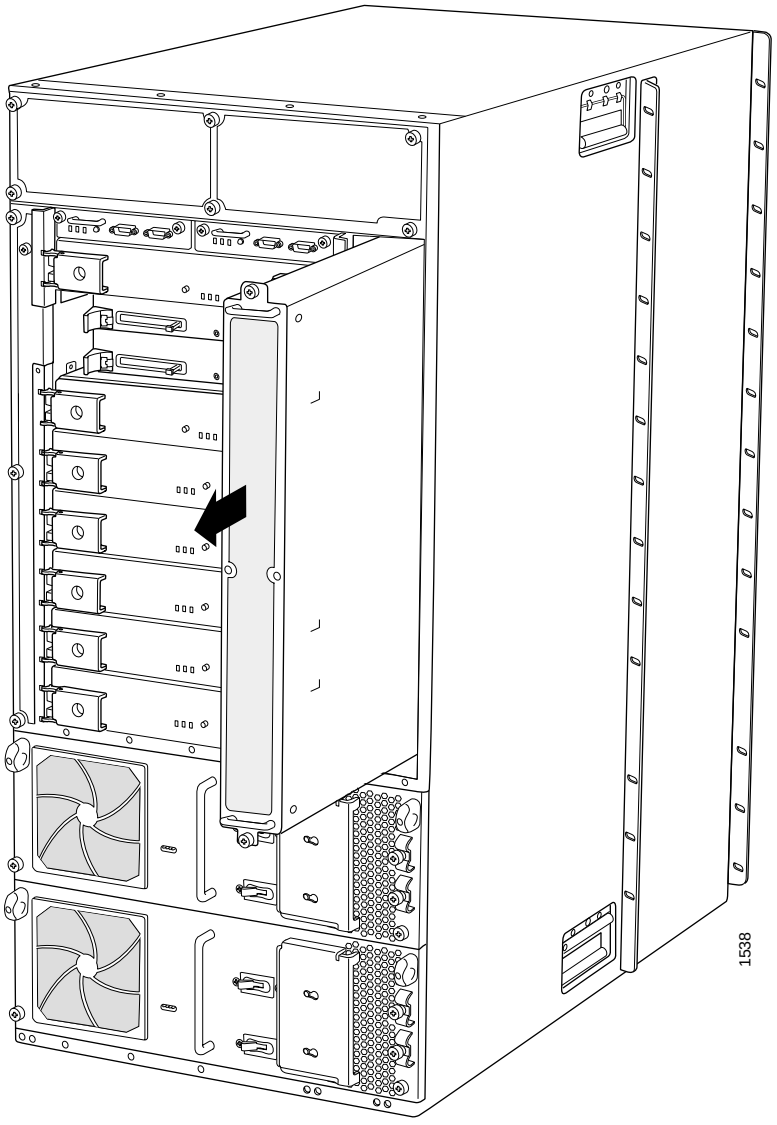
The rear fan tray is mounted vertically on the right side of the rear of the chassis. The rear fan tray contains five fans. The fan tray weighs about 12 lb (5.4 kg).

To maintain proper cooling, do not operate the router with the rear fan tray removed for more than one minute.

To remove the rear fan tray, follow this procedure (see Figure 38):

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
2. Loosen the captive screws on the top and bottom of the fan tray faceplate.
3. Grasp the handles and pull the fan tray halfway out of the chassis.
4. Place one hand under the fan tray to support it and pull the fan tray completely out of the chassis.

Figure 38: Remove the Rear Fan Tray



Remove the Cable Management System

The cable management system is located below the FPC card cage. The cable management system weighs approximately 5 lb (2.3 kg).

To remove the cable management system, follow this procedure:

1. Using the 3/8-in. nut driver, unscrew the nuts on the corners of the cable management system.
2. Grasp the bottom of the cable management system and pull it straight out from the studs on the front of the chassis.

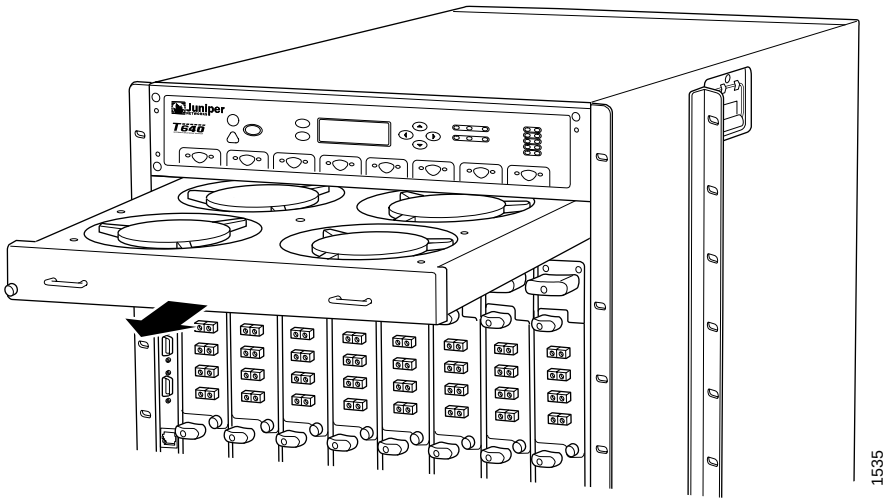
Remove the Front Fan Trays

The upper front fan tray is located above the FPC card cage, and the lower front fan tray is located below the air filter. Each fan tray weighs about 18.6 lb (8.4 kg).

To remove the front fan trays, follow this procedure (see Figure 39):

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
2. Loosen the captive screws on the corners of the faceplate of one of the fan trays.
3. Grasp the handles and pull the fan tray halfway out of the chassis.
4. Pull the fan tray completely out of the chassis.
5. Repeat Steps 2 through 4 to remove the remaining front fan tray.

Figure 39: Remove a Front Fan Tray



Remove the FPCs

The routing node holds up to eight FPCs, which are installed vertically in the front of the routing node. An empty FPC3 weighs 25 lb (11.3 kg), and an empty FPC2 weighs 22 lb (9.8 kg). A fully configured FPC can weigh up to 31.7 lb (14.4 kg).

Each FPC slot not occupied by an FPC must be covered by an FPC blank panel. An FPC blank panel weighs 9 lb (4.1 kg).

To remove an FPC, follow this procedure (see Figure 40):

1. Have ready an antistatic mat or electrostatic bag for each FPC.
2. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
3. Before removing the FPCs, record their location in the chassis so that you can reinstall each FPC in the correct slot.
4. Loosen the screws inside the ejector handles at the top and bottom of the FPC faceplate.
5. Simultaneously turn both the ejector handles counterclockwise to unseat the FPC.
6. Slide the FPC straight out of the card cage part of the way, grasping it by the ejector handles.
7. Hold the bottom of the FPC to support its weight.

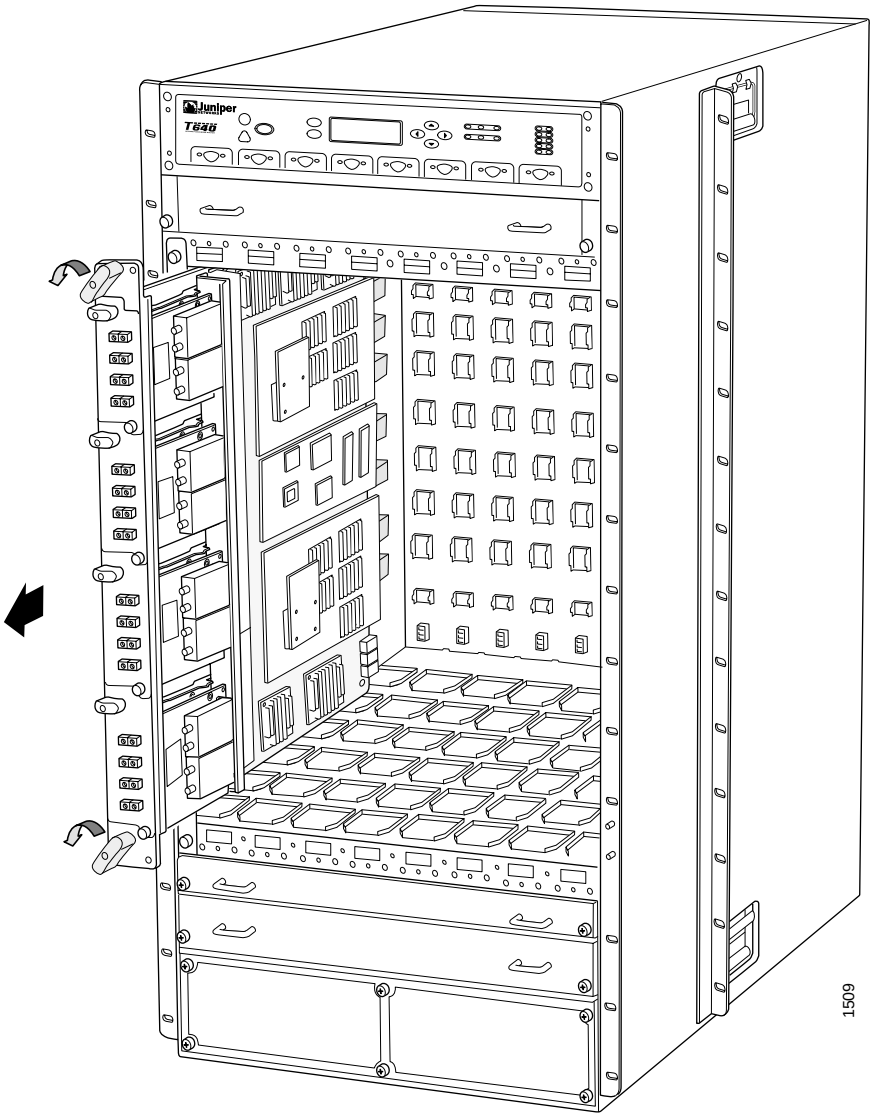
An FPC weighs at minimum 22 lb (10 kg) and can weigh as much as 31.7 lb (14.4 kg), depending on configuration. Be prepared to support the full weight of the FPC as you remove it from the routing node.

8. Slide the FPC all the way out of the chassis.
9. Place the removed FPC on an antistatic mat or in an electrostatic bag.

Do not stack FPCs after you remove them. Place each removed FPC on an antistatic mat or in an electrostatic bag resting on a flat, stable surface.

10. Repeat Steps 4 through 9 for each remaining FPC.

Figure 40: Remove an FPC



Install the Chassis into the Rack Manually

To install the routing node into the rack, follow this procedure (see Figure 42):

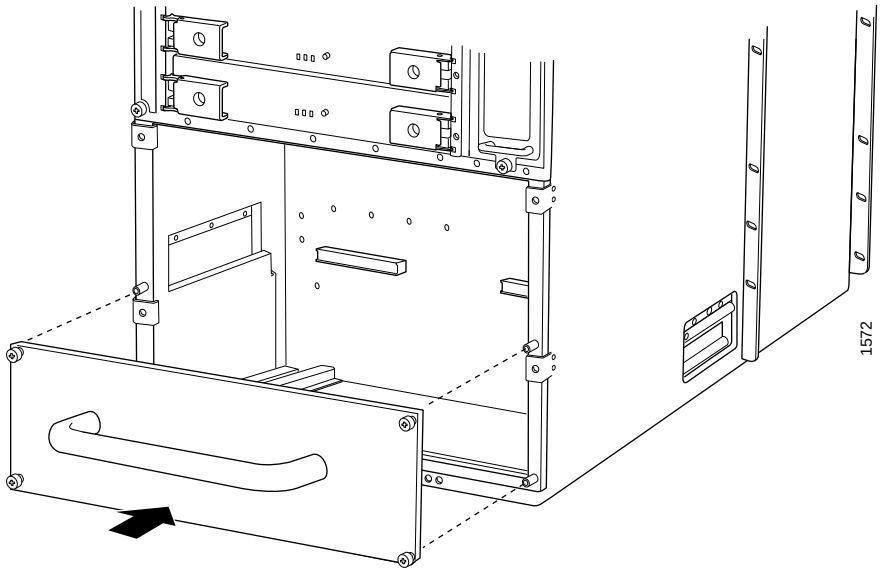
> **Caution**
>
> Lifting the chassis and mounting it into a rack requires four people. The empty chassis weighs approximately 210 lb (95.3 kg).

1. Ensure that the rack is in its permanent location and is secured to the building. Ensure that the installation site allows adequate clearance for both air flow and maintenance. For details, see “Prepare the Site” on page 49.

2. If you are installing the routing node into a front-mount rack, a four-post rack, or a cabinet, unscrew the screws securing the center-mount ears to the routing node chassis to remove the center-mount ears.

3. Attach the installation handle, firmly tightening the screws on the corners of the handle into the holes previously occupied by the captive screws of the two power supplies (see Figure 41).

Figure 41: Attach the Installation Handle



4. Move the routing node as close as possible to the rack. Use a pallet jack if one is available.

Do not lift the routing node using only the installation handle and the handles on the chassis. Use these handles only to help lift and position the routing node.

5. With two people in the rear each grasping the installation handle, and two people in the front each grasping the bar below the air filter with one hand and a handle on the side of the routing node with the other hard, lift and position the routing node a few inches above the mounting shelf installed in the rack.

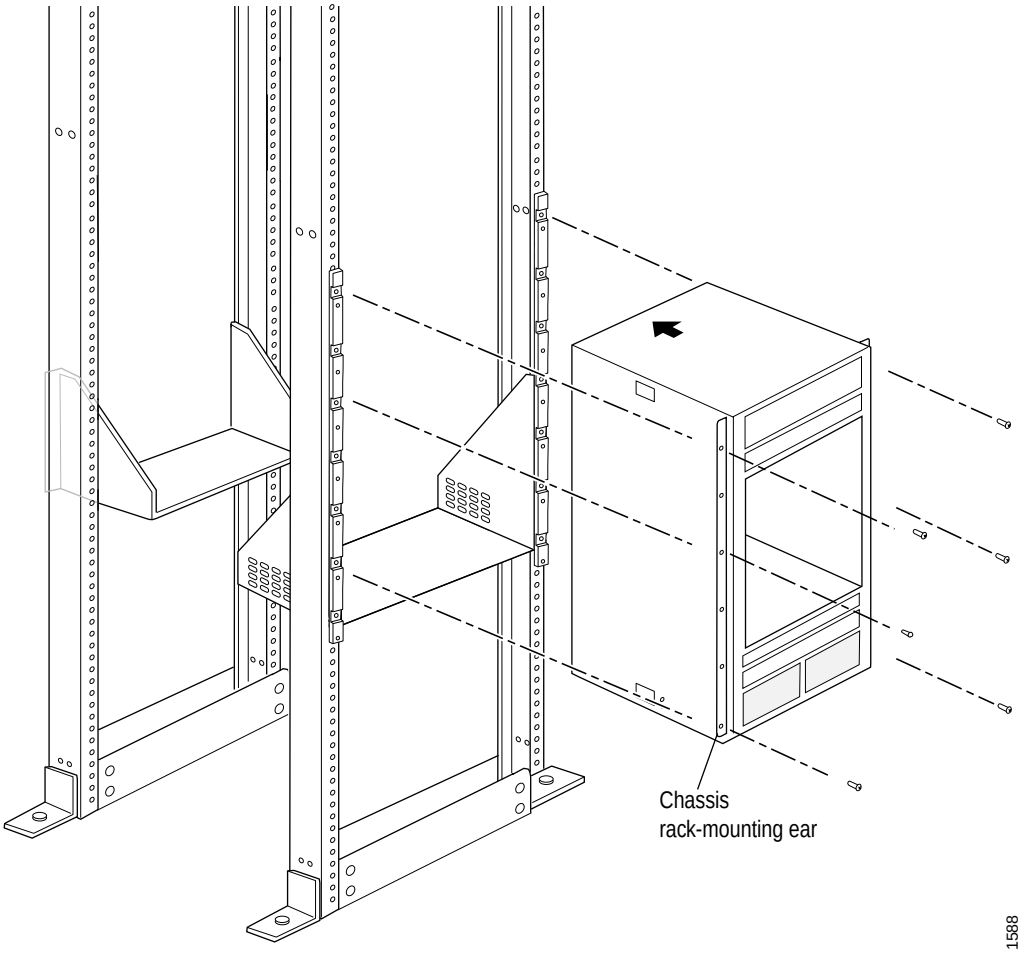
6. Carefully lower the routing node onto the shelf. The shelf ensures that the holes in the mounting ears align with the holes in the rack rails.

7. Push the routing node back onto the shelf until the mounting ears contact the rack rails. Use the installation handle and the handles on the sides of the chassis to help position the routing node.

8. If you are installing the routing node in a four-post rack or cabinet, install a mounting screw into each of the holes aligned with the threaded holes in the spacer bars. If you are installing the router into a center-mount or front-mount rack, install a mounting screw into each of the open mounting holes, starting from the bottom.

9. Loosen the captive screws at the corners of the lifting handle to remove the handle from the routing node.

Figure 42: Install the Routing Node into the Rack



Note

This illustration depicts the router being installed into a four-post rack. If you are installing the router into a center-mount or front-mount rack, only the front shelf is attached to the rack (see Figure 32 for an illustration of center-mounting hardware).

Verify That the Routing Node Is Installed Correctly

Visually inspect the alignment of the routing node. If the routing node is installed properly in the rack, all the mounting screws on one side of the rack should be aligned with the mounting screws on the opposite side and the routing node should be level.

Reinstall Components into the Chassis

When the routing node is installing in the rack, you reinstall the removed components before booting and configuring the routing node. The following procedures describe how to reinstall components into the chassis:

Into the rear of the chassis:

Reinstall the Rear Fan Tray on page 126

Reinstall the SCGs on page 128

Reinstall the CBs on page 128

Reinstall the Power Supplies on page 129

Into the front of the chassis:

Reinstall the FPCs on page 130

Reinstall the Front Fan Trays on page 132

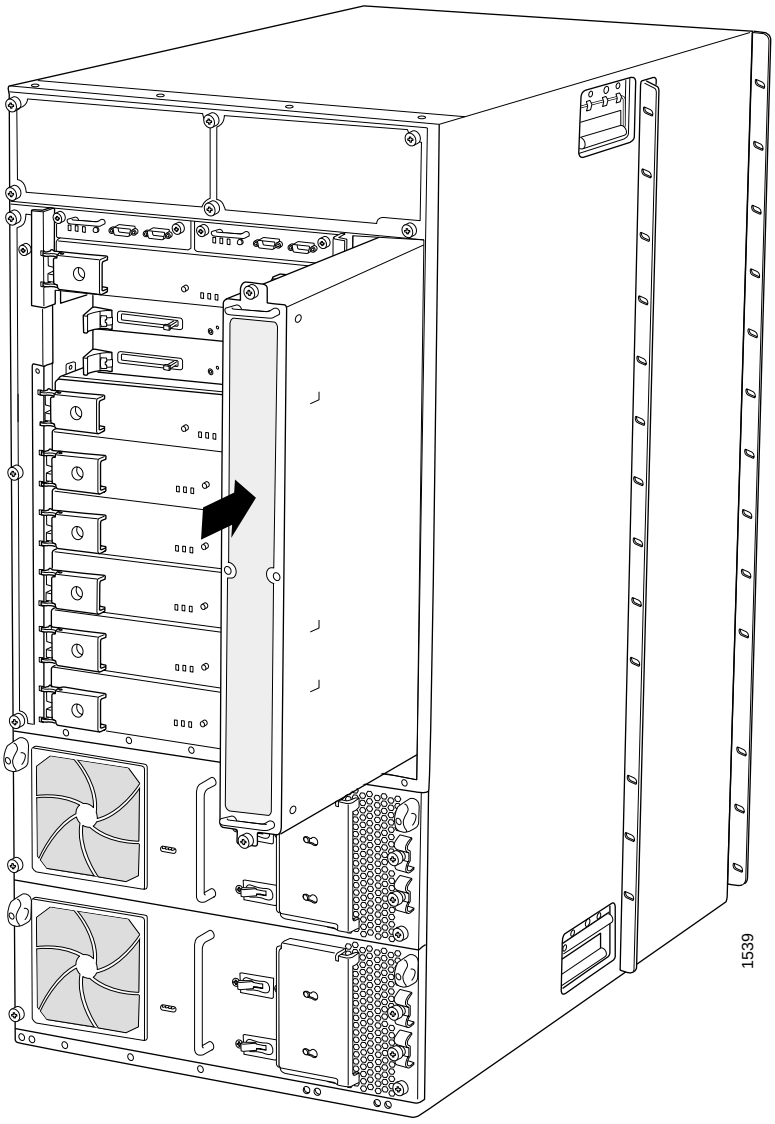
Reinstall the Cable Management System on page 132

Reinstall the Rear Fan Tray

To reinstall the rear fan tray, follow this procedure (see Figure 43):

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
2. Grasp the fan tray by the handles and insert it straight into the chassis.
3. Tighten the captive screws on the fan tray faceplate to secure it in the chassis.

Figure 43: Reinstall the Rear Fan Tray

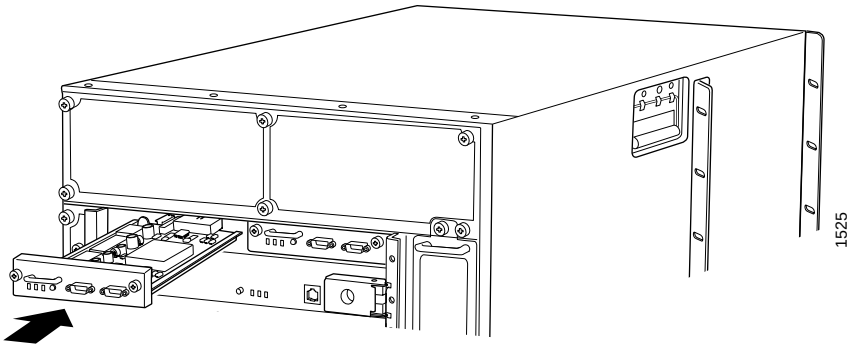


Reinstall the SCGs

To reinstall the SCGs, follow this procedure:

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
2. Remove the replacement SCG from its electrostatic bag.
3. Carefully align the sides of the SCG with the guides in the SCG slot.
4. Grasp the SCG by its handle and slide it straight into the chassis until it contacts the midplane.
5. Tighten the captive screws on the corners of the SCG faceplace.
6. To bring the SCG online, press the online/offline button until the green ONLINE LED lights.
7. Repeat Steps 2 through 6 to reinstall the remaining SCG.

Figure 44: Install a Replacement SCG

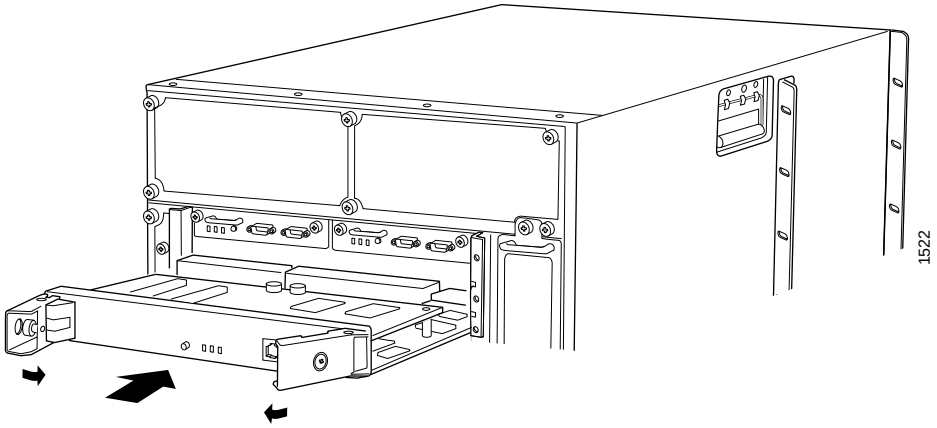


Reinstall the CBs

To reinstall the CBs, follow this procedure (see Figure 45):

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
2. Carefully align the sides of the CB with the guides inside the chassis.
3. Slide the CB all the way into the chassis.
4. Grasp both ejector handles and press them inwards to seat the CB.
5. Tighten the captive screws on the ejector handles.
6. Repeat Steps 2 through 5 to reinstall the remaining CB.

Figure 45: Reinstall a CB

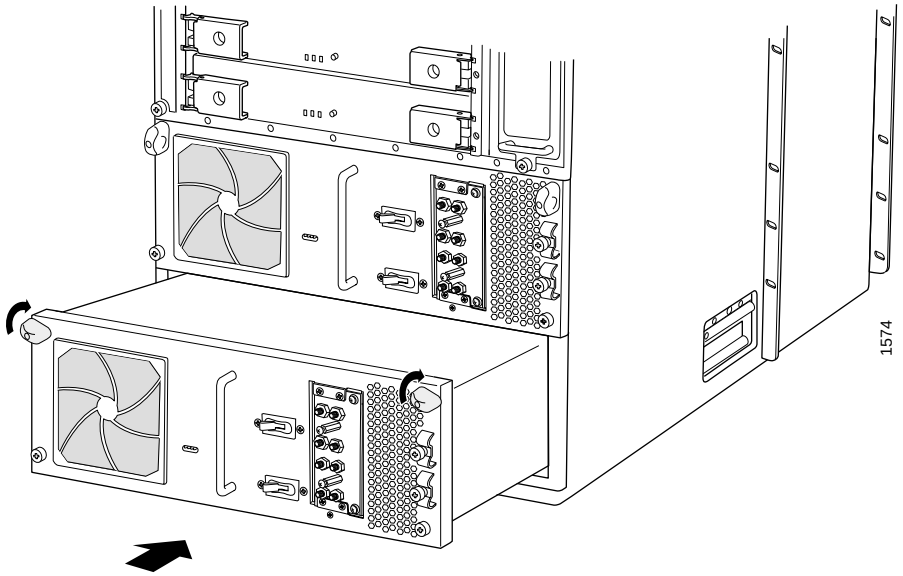


Reinstall the Power Supplies

If the routing node has two power supplies, reinstall the lower power supply first, then the upper power supply. To reinstall the power supplies, follow this procedure (see Figure 46):

1. Make sure that both circuit breakers on the replacement power supply are turned OFF.
2. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
3. Using both hands, slide the power supply into the chassis until you feel resistance.
4. Twist the ejector handles at the upper corners of the power supply faceplate clockwise.
5. Tighten the captive screws at the lower corners of the faceplate to secure the power supply in the chassis.
6. Repeat Steps 3 through 5 to reinstall the upper power supply.

Figure 46: Reinstall a Power Supply



Reinstall the FPCs

To reinstall the FPCs, follow this procedure (see Figure 47):

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.

2. Using the list you created when you removed the FPCs, locate the slot in the FPC card cage in which you plan to install each FPC.

3. Lift the FPC into place and carefully align first the bottom, then the top of the FPC with the guides inside the card cage. Be sure the FPC is right-side up, with the components on the right of the FPC.

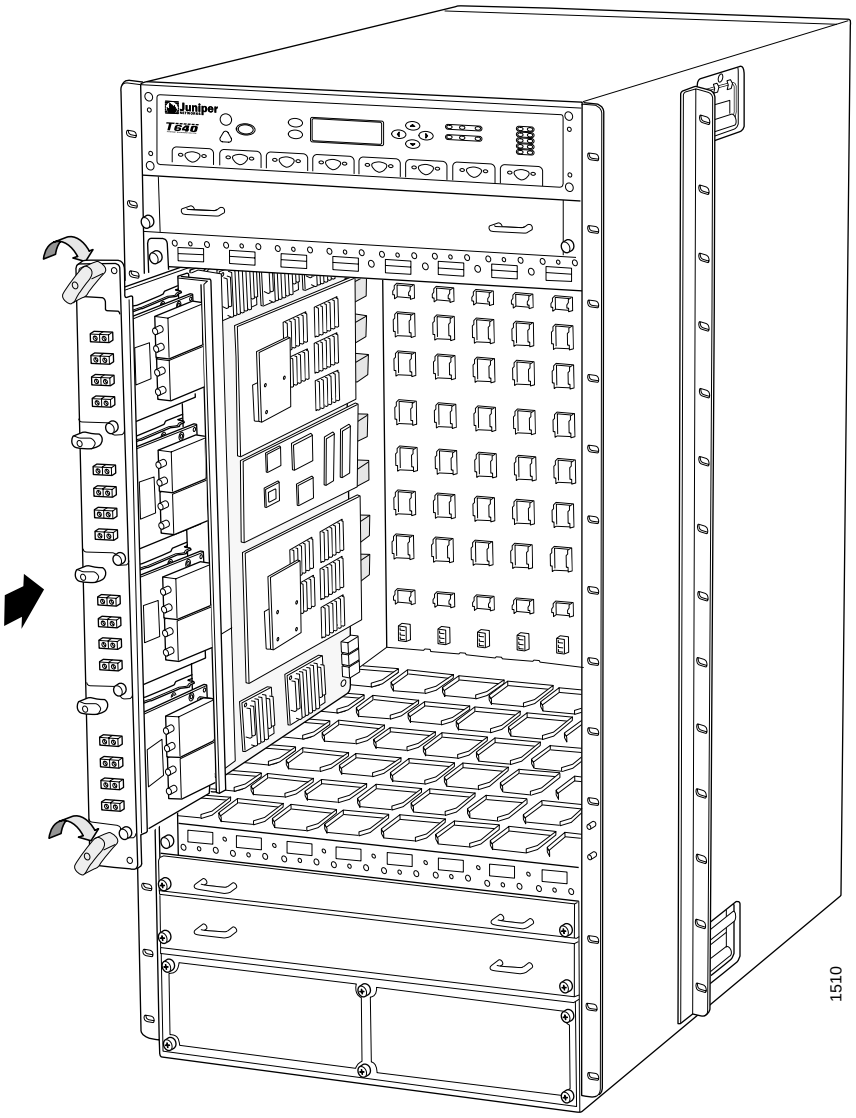
4. Slide the FPC all the way into the card cage until you feel resistance.

5. Starting with the ejector handles on the FPC faceplate in a position close to horizontal, simultaneously turn both ejector handles clockwise to seat the FPC.

6. Tighten the screws inside the ejector handles to secure the FPC. Do not overtighten them.

7. Repeat Steps 3 through 6 to reinstall each remaining FPC.

Figure 47: Reinstall an FPC

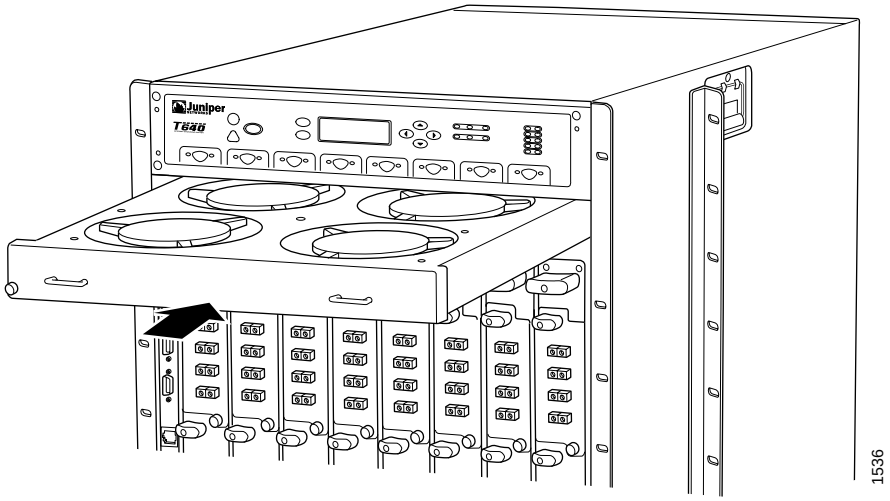


Reinstall the Front Fan Trays

To reinstall the front fan trays, follow this procedure (see Figure 48):

1. Attach an ESD wrist strap to your bare wrist, and connect the wrist strap to one of the ESD points on the chassis.
2. Grasp the replacement fan tray by the handles and insert it straight into the chassis.
3. Tighten the captive screws on the fan tray faceplate to secure it in the chassis.
4. Repeat Steps 2 and 3 to reinstall the remaining fan tray.

Figure 48: Reinstall a Front Fan Tray



Reinstall the Cable Management System

To reinstall the cable management system, use the following procedure:

1. Position the cable management system on the studs on the lower front of the chassis.
2. Insert the nuts through the holes in the cable management system onto the studs on the chassis.
3. Using the 3/8-in. nut driver, tighten the nuts securely.

Connect the Routing Node to External Devices

After you have installed the routing node into the rack, you connect external devices to the routing node to configure, manage, and service the routing node. Table 22 lists the cable specifications for each external device.

Table 22: External Device Cable Specifications

Device	Cable Specification	Supplied with the Routing Node	Maximum Length	Connector Type
Routing Engine console and auxiliary ports	RS-232 serial	One 6-ft length	6 ft (1.83 m)	DB-9 female
Routing Engine Ethernet Management port	Category 5 or equivalent suitable for 100BaseT operation	One 15-ft length	328 ft (100 m)	RJ-45
Alarm relay contacts	14-28 AWG wire	No	—	—

To connect external devices, use the following procedures:

Connect a Management Console on page 133

Connect an Auxiliary Device on page 134

Connect to a Network for Out-of-Band Management on page 134

Connect Alarm Relay Cables on page 135

Connect a Management Console

You can use a console to configure and manage the routing node. To connect a console to the routing node, follow this procedure:

1. Locate the appropriate cable and connector (see Figure 49 and Table 22).
2. Turn off the console power switch.
3. Plug the female end of the console cable connector into the CONSOLE port on the CIP (see Figure 50).
4. Tighten the screws on the connector.

Figure 49: Console and Auxiliary Port Connector

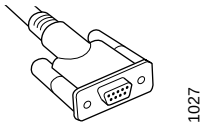
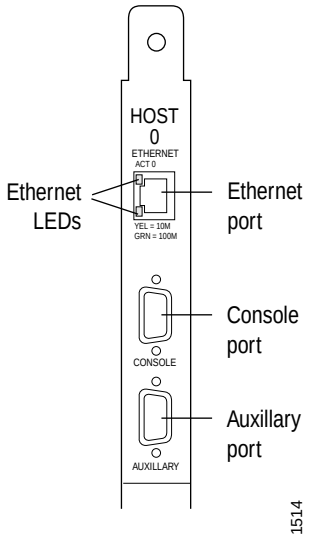


Figure 50: Routing Engine Ports on the CIP



Connect an Auxiliary Device

You can connect a modem, laptop, or other auxiliary device to the routing node. To connect an auxiliary device to the routing node, follow this procedure:

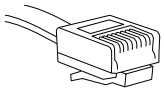
1. Locate the appropriate cable and connector (see Figure 49 and Table 22).
2. Turn off the auxiliary device power switch.
3. Plug the female end of the console cable connector into the AUXILIARY port on the CIP (see Figure 50).
4. Tighten the screws on the connector.

Connect to a Network for Out-of-Band Management

You can connect the routing node to a network for out-of-band management. To connect the routing node to a network, follow this procedure:

1. Locate the appropriate cable and connector (see Figure 51 and Table 22).
2. Plug one of the Ethernet cable connectors into the ETHERNET port on the CIP (see Figure 50).
3. Plug the other end into the network device.

Figure 51: Ethernet Cable Connector



Connect Alarm Relay Cables

You can connect the routing node to an external alarm device so that red or yellow alarm conditions on the routing node also trigger the external device. Two alarm relay contacts are located on the CIP. The upper alarm relay contact is triggered by a red alarm condition and the lower one is triggered by a yellow alarm condition.

To connect the alarm relays contacts, follow this procedure:

1. Locate an appropriate length of 14–28 AWG wire that can be used with the alarm relay terminals.

2. For the upper alarm cable, loosen the small screws on the terminal block and attach the wire to the alarm relay contact. This is the contact triggered by a red alarm condition.

3. Attach the other end of the wire to the external device to be activated when a red alarm condition occurs.

4. For the lower alarm cable, loosen the small screws on the terminal block and attach the second wire to the lower alarm relay contact. The lower alarm relay is triggered by a yellow alarm condition.

5. Attach the other end of the second wire to the external device to be activated by a yellow alarm condition.

Connect the PIC Cables

You connect the PICs installed in the routing node's FPCs to various network media. To connect the PIC cables to the cable connectors on the front of the PICs, follow this procedure:

1. Identify the appropriate cable to connect to each PIC (see Table 14 on page 57).

Do not look directly into PICs that are attached to an FPC. PICs that use SONET or ATM single-mode optical fiber contain laser light sources that can damage your eyes.

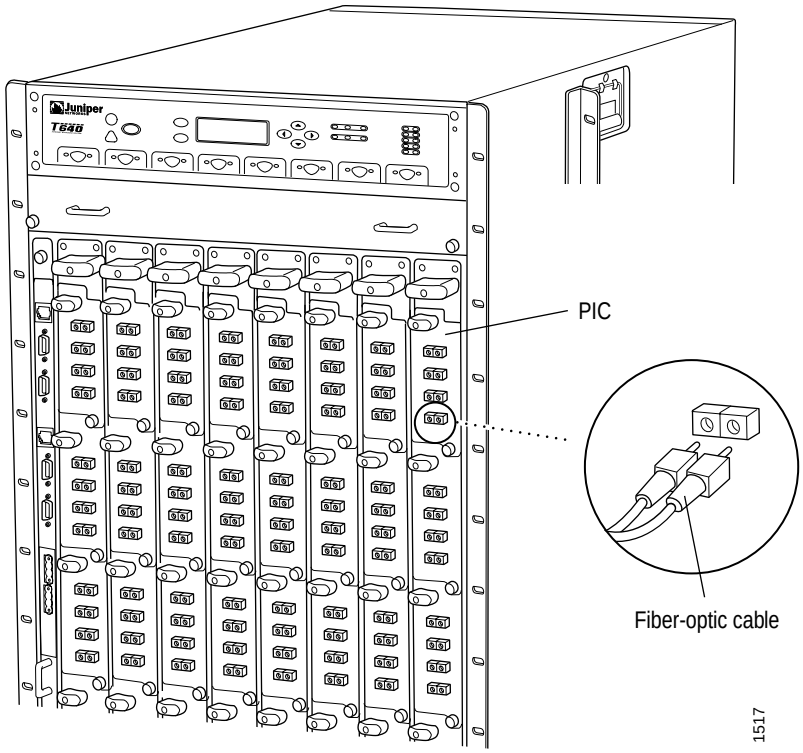
2. When installing PICs with optical interfaces, remove the rubber safety plug from the cable receptacle.

3. Insert the appropriate cable connector into the PIC cable receptacle.

4. Drape cable over the bobbins of the cable management system below the FPC card cage to prevent cables from dislodging or developing stress points. Secure the fiber so that it is not supporting its own weight. Place excess fiber out of the way in a neatly coiled loop in the cable management tray. Use fasteners to help maintain the loop's shape.

> **Caution**
>
> Never let fiber-optic cable hang free from the connector. Do not allow fastened loops of cable to dangle, because this stresses the cable at its fastening point.

Figure 52: Attach Cable to a PIC



For a list of PIC cable specifications, see Table 14 on page 57.

Connect Power to the Routing Node

You connect power to the routing node by attaching power cables from the DC power source to the terminal studs on the power supply faceplates. To connect power to the routing node, you must provide power and grounding cables with appropriate cable lugs. For power and grounding cable specifications, see "Power Requirements and Specifications" on page 53 and "System Grounding Guidelines" on page 56.

To connect the DC source power cables to the routing node, follow this procedure:

1. Ensure that the voltage across the DC power source cable leads is 0 V and that there is no chance that the cable leads might become active during installation.

   There is no color code standard for DC wiring. The color coding used by the site DC power source determines the color coding of the DC power cable leads to the power supplies. You must ensure that the proper polarity is connected to the power supplies. The power source DC cables might be marked with a (+) or a (–) label, indicating the cable polarity.

2. Place the grounding cable lug over the grounding points on bottom rear of the chassis. The grounding cable should already be attached to a proper earth ground for the DC power sources.

3. Secure the grounding cable lug to the grounding points, first with the washer, then with the bolt.

4. Remove the clear plastic cover from the faceplate of one of the power supplies.

5. Attach the power cable lugs for one power source to the terminal studs on the power supply faceplate (see Figure 53).

   Connect the positive (+) source DC power cable lugs to the RTN (return) terminals on the faceplate.

   Connect the negative (–) source DC power cable lugs to the –48V (input) terminals on the faceplate.

6. Secure the power cable lugs to the terminal studs, first with the washers, then with the nuts.

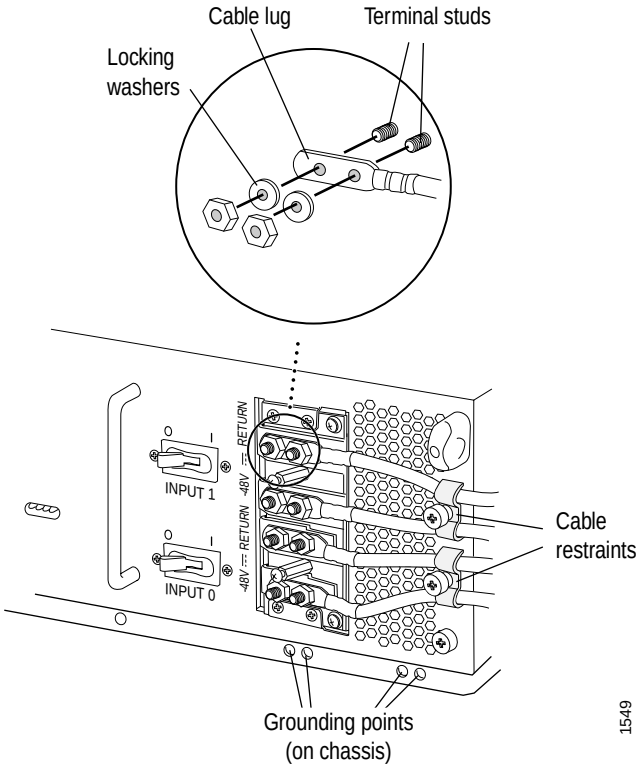
7. Attach the cable restraints to the edge of the power supply faceplate to hold the power cables in place.

8. Verify that the ground and power cabling are correct.

9. Replace the clear plastic cover on the power supply faceplate.

10. Repeat Steps 4 through 9 for the second power supply.

Figure 53: Connect Power to the Routing Node



Power Up the Routing Node

To power up the routing node, follow this procedure:

1. Make certain that the power supply is fully inserted in the chassis and that the captive screws are tightened.

2. Turn on the power to the management device that is connected to the Routing Engine through the CONSOLE or ETHERNET port.

3. Turn the switches on one of the power supplies ON and observe the LEDs on the power supply faceplate. If the power supply is correctly installed and is functioning properly, the DC OK LED lights steadily, and the CB ON LED blinks momentarily, then lights steadily.

4. Turn on the second circuit breaker and observe the LEDs on the second power supply faceplate. They should follow the sequence described in Step 3.

5. Turn on the second circuit breaker and observe the LEDs on the second power supply faceplate. They also should follow the sequence described in Step 3.

> **Note** If the CB ON and DC OK LEDs do not light steadily, repeat the installation and cabling procedures described in "Reinstall the Power Supplies" on page 129 and "Connect Power to the Routing Node" on page 137.

6. On the management device, monitor the startup process to verify that the system has booted properly.

Perform Initial Software Configuration

When you receive the routing node, the JUNOS Internet software is preinstalled and is ready to be configured when the routing node is powered on. The primary copy of the software is installed on a nonrotating flash disk, and two backup copies are included: one on the routing node's rotating hard disk and a second on a PC card that ships with the routing node. When the routing node boots, it first attempts to start the image from a PC card if one is installed in the Routing Engine. If this fails, the routing node next tries the flash disk, then finally the hard disk.

You can configure the routing node from a console attached to the CONSOLE port on the CIP, or by using telnet over a network connected to the ETHERNET port. Before you configure the routing node, you need the following information:

Name the routing node will use on the network

Domain name the routing node will use

IP address and prefix length information for the Ethernet interface

IP address of a default router

IP address of a DNS server

Password for the root user

To configure the software, follow this procedure:

1. Power up the routing node as described in "Power Up the Routing Node" on page 138.

2. Log in as the "root" user. There is no password.

3. Start the CLI.

```
root# cli
root@>
```

4. Enter configuration mode.

```
cli> configure
[edit]
root@#
```

5. Configure the name of the routing node. If the name includes spaces, enclose the name in quotation marks (“ “).

   ```
   [edit]
   root@# set system host-name host-name
   ```

6. Configure the routing node’s domain name.

   ```
   [edit]
   root@# set system domain-name domain-name
   ```

7. Configure the IP address and prefix length for the routing node’s Ethernet interface.

   ```
   [edit]
   root@# set interfaces fxp0 unit 0 family inet address address/prefix-length
   ```

8. Configure the IP address of a backup router, which is used only while the routing protocol is not running.

   ```
   [edit]
   root@# set system backup-router address
   ```

9. Configure the IP address of a DNS server.

   ```
   [edit]
   root@# set system name-server address
   ```

10. Set the root authentication password by entering either a clear-text password, an encrypted password, or an ssh public key string (DSA or RSA).

    ```
    [edit]
    root@# set system root-authentication plain-text-password
    New password: password
    Retype new password: password
    or
    [edit]
    root@# set system root-authentication encrypted-password encrypted-password
    or
    [edit]
    root@# set system root-authentication ssh-dsa public-key
    or
    [edit]
    root@# set system root-authentication ssh-rsa public-key
    ```

11. Optionally, display the configuration to verify that it is correct.

```
[edit]
root@# show
system {
    host-name host-name;
    domain-name domain-name;
    backup-router address;
    root-authentication {
        authentication-method (password | public-key);
    }
    name-server {
        address;
    }
}
interfaces {
     fxp0 {
        unit 0 {
            family inet {
                address address/prefix-length;
            }
        }
    }
}
```

12. Commit the configuration. This activates the configuration on the routing node.

```
[edit]
root@# commit
```

13. Optionally, configure additional properties by adding the necessary configuration statements. Then, commit the changes to activate them on the routing node.

```
[edit]
root@host-name# commit
```

14. When you have finished configuring the routing node, exit configuration mode.

```
[edit]
root@host-name# exit
root@host-name>
```

The routing node is now connected to the network but is not fully configured. You must perform additional configuration before the routing node can pass traffic. For complete information about configuring the routing node, including examples, see the JUNOS Internet software configuration guides.